Practical Tips and Problem Solving for Trail Projects

With

SCA Massachusetts AmeriCorps

Rob Hopkinson, Conservation Coordinator Melissa Patterson, Program Director











SCA Massachusetts AmeriCorps

Ten month residential AmeriCorps program in partnership with Massachusetts DCR and the Massachusetts Service Alliance.

Based at Kenneth Dubuque State Forest in Hawley, Massachusetts.





Members complete conservation service projects on public lands in the spring and summer.

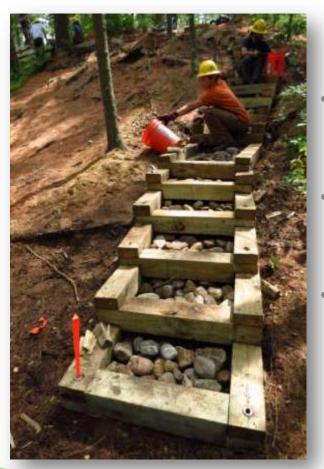












Objectives

- Identify appropriate applications of trail structures for problem solving on existing trails.
- Offer tools for identifying best practice solutions for specific problem areas on **existing trails**.
- Share tips for recruiting and working with volunteers.









Why is water on the trail a problem?



- Erosion- moving water is a major cause of erosion on trails.
- The greater the speed and volume of water, the more material is transported.
- We can mitigate erosion by installing structures (simple or complex), and by using sustainable trail design techniques.
- Structures require time to build and energy to maintain. Weigh time, cost, and maintenance schedule before deciding how to proceed.











Simple, Effective Solutions

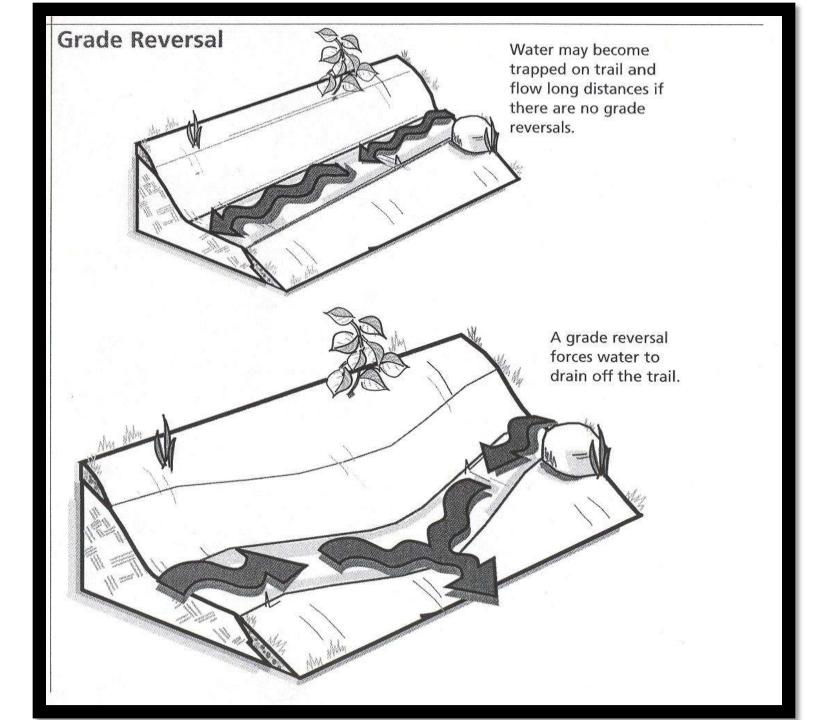
• Grade Reversal











Simple, Effective Solutions

• Grade Reversal

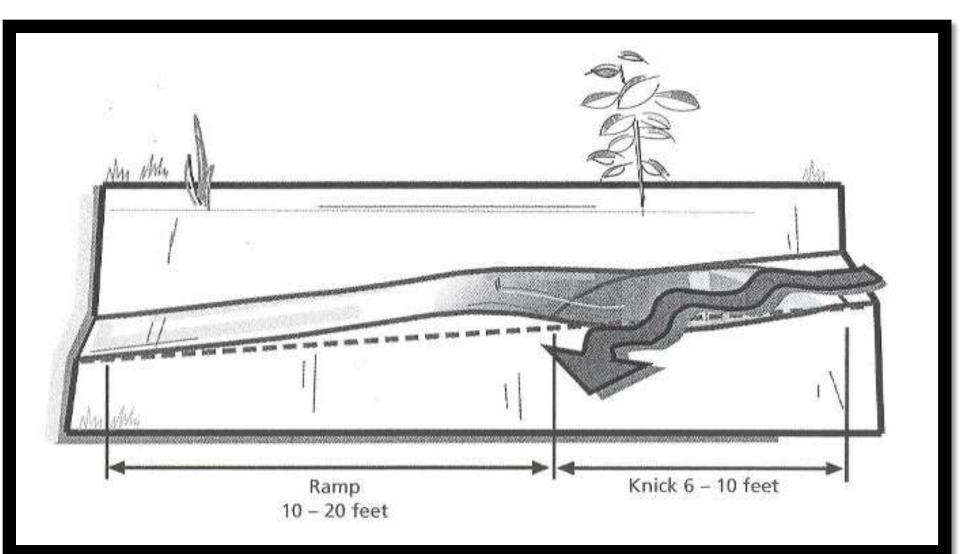
Rolling Grade Dip













Simple, Effective Solutions

- Grade Reversal
- Rolling Grade Dip
- Water Bars

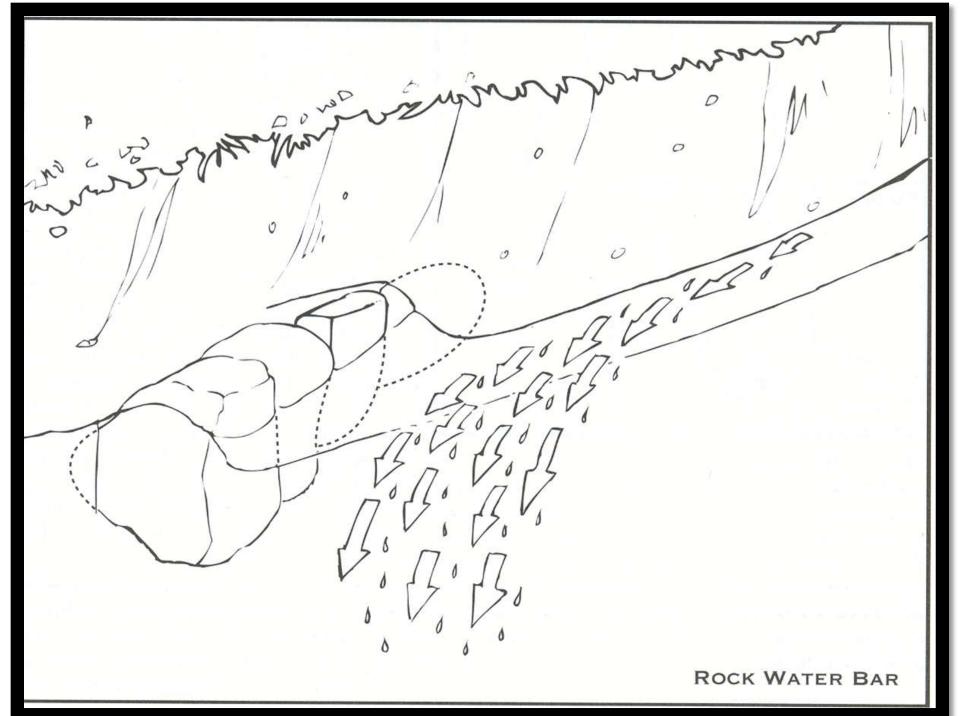












Simple, Effective Solutions

- Grade Reversal
- Rolling Grade Dip
- Water Bars
- Reinforced Rolling Grade Dips











Solutions for Larger Volumes of Water

Open culvert- stone armored vs. earth-bottomed











Solutions for Larger Volumes of Water

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- Uphill drains or ditches combined with culvert











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- Closed culvert- be sure to install culverts of appropriate size!











Solutions for Larger Volumes of Water

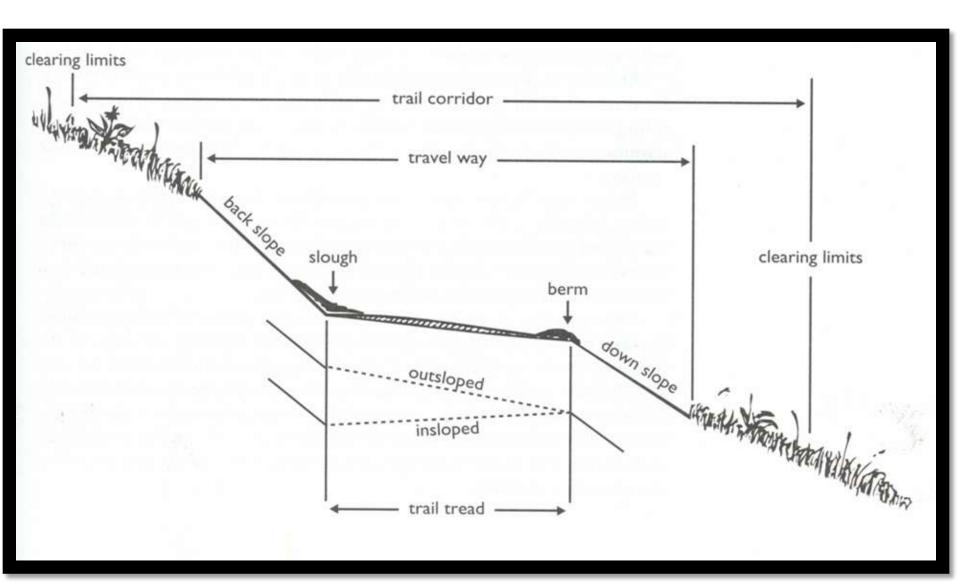
- Open culvert- stone armored vs. earth-bottomed
- Uphill drains or ditches combined with culvert
- Closed culvert- be sure to install culverts of appropriate size!
- Crowning or outsloping tread surface sheds water and encourages sheet flow.

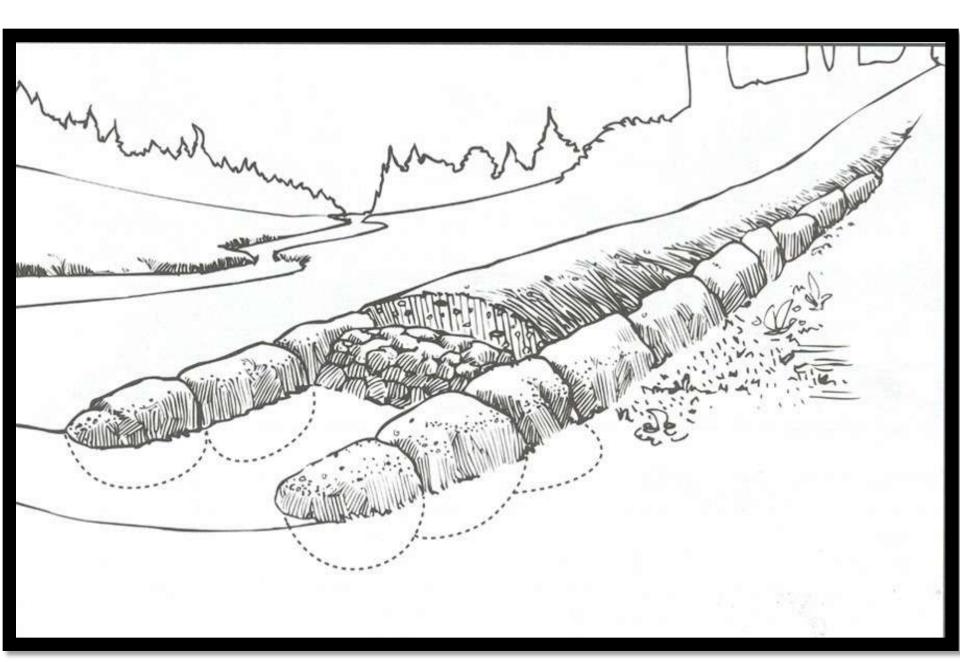












Structures for Erosion Prone Areas

- When ascending short, steep slopes, utilize steps to eliminate erosion issues. Types of steps include:
 - a. Dimensional Lumber steps
 - b. Native Timber steps
 - c. Stone steps















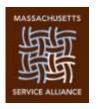


Structures for Erosion Prone areas

- When ascending short, steep slopes, utilize steps to eliminate erosion issues.
- Erosion on steep trails can be slowed or reversed using check steps or check dams.

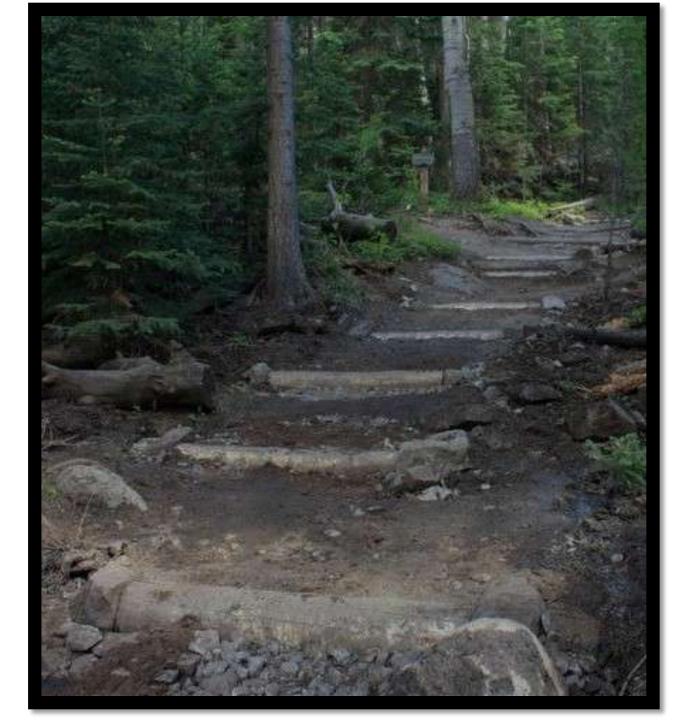












Structures for Erosion Prone areas

- When ascending short, steep slopes, utilize steps to eliminate erosion issues.
- Erosion on steep trails can be slowed or reversed using check steps or check dams.
- Trails that traverse steep slopes and are prone to "slipping" can utilize retaining walls to hold the tread surface in place.





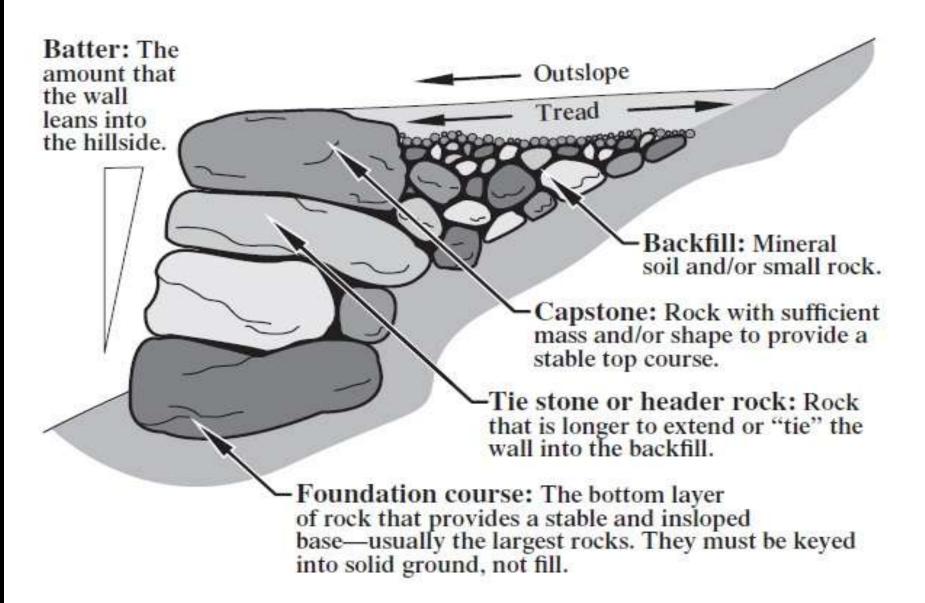








Rock Retaining Wall Terminology



Structures for Erosion Prone areas

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- Erosion on steep trails can be slowed or reversed using check steps or check dams.
- Trails that traverse steep slopes and are prone to "slipping" can utilize retaining walls to hold the tread surface in place.
- If traversing long, steep slopes is unavoidable, utilize switchbacks to maintain a controlled grade and prevent volume and speed from accumulating.











Constructing Durable Tread Surfaces

First and least intensive option: reroute the trail!

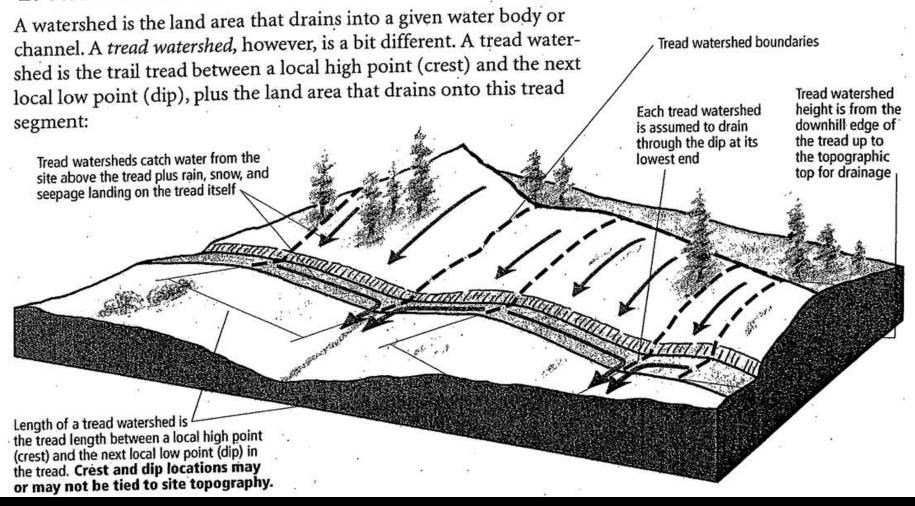








Tread Watershed



Constructing Durable Tread Surfaces

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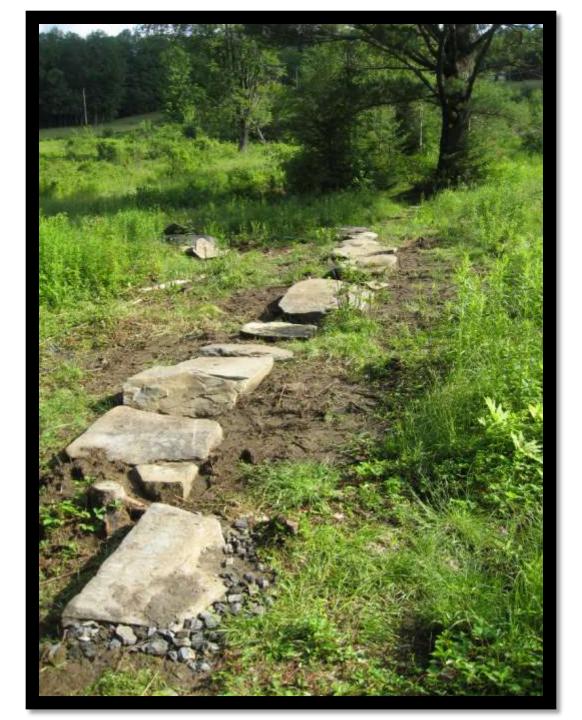
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- Raising the tread surface in perennially wet areas: turnpikes.
- Stabilizing tread in erosion prone soils: stone armoring or rock pavement.
- Building accessible trails through challenging areas: boardwalk construction
- Crossing rivers, streams, and ravines: bridge construction.

















Trail Users













Types of Trail Users



- Hikers
- Mountain bikers
- Horseback
- Snow mobile
- ATV
- Cross country skier
- Universal access
- Multi-use





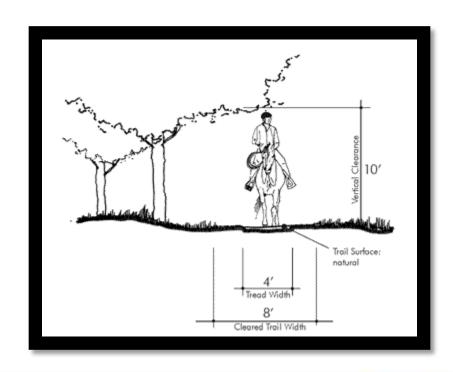






Maintaining trails for specific trail users















Trail Class Attributes

Trail Attributes	Trail Class 1 Minimal/ Un developed Trail	Trail Class 2 Simple/ Minor Development Trail	Trail Class 3 Developed/ Improved Trail	Trail Class 4 Highly Developed Trail	Trail Class 5 Fully Developed Trail
General Criteria					
Tread & Traffic Flow	Tread intermittent and often indistinct May require route finding Native materials only	Tread discernible and continuous, but narrow and rough Few or no allowances constructed for passing Native materials	Tread obvious and continuous Width accommodates unhindered one-lane travel (occasional allowances constructed for passing) Typically native materials	Tread wide and smooth with few irregularities Width may consistently accommodate two-lane travel Native or imported materials May be hardened	Width generally accommodates two-lane and two-directional travel, or provides frequent passing turnouts Commonly hardened with asphalt or other imported material
Obstacles	Obstacles common Narrow passages; brush, steep grades, rocks and logs present	Obstacles occasionally present Blockages cleared to define route and protect resources Vegetation may encroach into trailway	Obstacles infrequent Vegetation cleared outside of trailway	Few or no obstacles exist Grades typically <12% Vegetation cleared outside of trailway	No obstacles Grades typically <8%
Constructed Features & Trail Elements	Minimal to non- existent Drainage is functional No constructed bridges or foot crossings	Structures are of limited size, scale, and number Drainage functional Structures adequate to protect trail infrastructure and resources Primitive foot crossings and fords	Trail structures (walls, steps, drainage, raised trail) may be common and substantial Trail bridges as needed for resource protection and appropriate access Generally native materials used in Wilderness	Structures frequent and substantial Substantial trail bridges are appropriate at water crossings Trailside amenities may be present	Structures frequent or continuous; may include curbs, handrails, trailside amenities, and boardwalks Drainage structures frequent; may include culverts and road-like designs
Signs	Minimum required Generally limited to regulation and resource protection No destination signs present	Minimum required for basic direction Generally limited to regulation and resource protection Typically very few or no destination signs present	Regulation, resource protection, user reassurance Directional signs at junctions, or when confusion is likely Destination signs typically present Informational and interpretive signs may be present	Wide variety of signs likely present Informational signs likely Interpretive signs possible Trail Universal Access information likely displayed at trailhead	Wide variety of signage is present Information and interpretive signs likely Trail Universal Access information is typically displayed at trailhead
Typical Recreation Environs & Experience	Natural, unmodified ROS: Often Primitive setting, but may occur in other ROS settings WROS: Primitive	Natural, essentially unmodified ROS: Typically Primitive to Semi-Primitive setting WROS: Primitive to Semi-Primitive	Natural, primarily unmodified ROS: Typically Semi-Primitive to Semi-Developed Natural setting WROS: Semi-Primitive to Transition	May be modified ROS: Typically Semi- Developed Natural to Developed Natural setting WROS: Transition	Can be highly modified ROS: Typically Developed Natural to Urban setting Commonly associated with Visitors centers or high-use recreation sites

Available Resources



- Materials
- Available funds
- Labor/level of skill
- Time









Working with Volunteers











Scheduling and Recruiting





- Weekends are best for most volunteers, find a day that works for most people
- Get the word out!
- Target groups in addition to individuals
- Be clear about timing of the day, what to bring, wear, and nature of the work
- Request RSVP













Planning

- Plan for safety
- Plan realistic tasks/projects
- Get all necessary permissions
- Have a plan for tools
- Offer a variety of projects of varying difficulty to allow everyone to participate
- Are facilities are available to volunteers?













Facilitating a volunteer work day

- Welcome, introductions and orientation
- Safety, tool use and PPE
- Stay on schedule (lunch, breaks, end of day)
- Give everyone the opportunity to try cool jobs!
- Provide lunch, treats, water if possible
- Take photos!











Keep it positive!

In addition to completing work, hosting a volunteer work day achieves three main goals...









Empowerment and mastery of skill











Connection to place













Life long stewardship













Questions?











Additional Resources

Organizations/Companies:

- Professional Trail Builders Association: Offers courses in sustainable trail construction and design. http://trailbuilders.org
- Federal Highway Administration's Manuals and Guides for Trail Design, Construction, Maintenance, and Operation: http://www.fhwa.dot.gov/environment/recreational_trails/guidance/manuals.cfm
- The Department of Conservation and Recreation's Greenways and Trails Program:

 http://www.mass.gov/eea/agencies/dcr/services-and-assistance/grants-and-technical-assistance/greenways-and-trails-program.html
- The Stone Trust: Offers courses of a variety of lengths in dry-stack stone walling. Based in Vermont: http://thestonetrust.org/workshop/one-day-workshops
- Northeast Woodland Training: chainsaw training for a variety of skill levels: http://www.woodlandtraining.com/
- Trail Services: Sells a variety of tools and equipment for trail construction: http://www.trailservices.com/
- International Mountain Bicycling Association: offers tips, courses, and information on mountain bike specific trails: https://www.imba.com/

Books:

- Lightly on the Land: The SCA Trail Building And Maintenance Manual
- The Appalachian Mountain Club Complete Guide to Trail Building and Maintenance
- Natural Surface Trails by Design
- The Granite Kiss









